

[0045] Having thus described the invention and preferred embodiments, what is claimed is:

- 1 1. A roll assembly for use on a crop conditioning machine comprising:
2 first and second elongate rotatable rolls supported in a framework for
3 rotation about respective first and second axes of rotation and disposed in
4 adjacent parallel relationship, said first roll generally above said second roll;
5 each said first and second rolls having a peripheral surface;
6 said second roll comprising an elongate cylindrical rigid body portion
7 having a generally smooth peripheral surface with a layer of hard
8 elastomeric material affixed thereto, said elastomeric layer having at least
9 one groove therein, said groove being formed in a spiral along the length of
10 said rigid body portion; and
11 said at least one groove generally having a step-like cross-sectional
12 configuration comprised of at least a first and second surfaces, said first
13 surface being generally perpendicular to the tangent of said peripheral
14 surface of said second roll and said second surface tapering at an angle
15 from the edge of said first surface closest to said second axis of rotation,
16 forming a trailing edge to said peripheral surface of said second roll, forming
17 a leading edge.
- 1 2. The assembly of Claim 1, wherein:
2 said first surface has a depth in the range of 0.25 to 0.50 inches.
- 1 3. The assembly of Claim 2, wherein:
2 said second surface has a length in the range of 1.0 to 1.5 inches.
- 1 4. The assembly of Claim 3, wherein:
2 said first and second rolls are substantially identical and said at least one
3 groove is an equal number of each in the range of 3 to 8; and

1 said grooves are symmetrically and continuously arranged around the
2 respective peripheral surfaces of first and second rolls.

1 5. The assembly of claim 3, wherein:
2 said at least a first and second surfaces includes a third surface
3 adjacent to said second surface and at a slight upward angle relative
4 thereto.

1 5. The assembly of Claim 4, wherein:
2 said elastomeric material is urethane.

1 6. The assembly of Claim 5, wherein:
2 said elastomeric material comprises 80 Shore A durometer or higher.

1 7. The assembly of Claim 6, wherein:
2 said first and second rolls are timed to rotate such that the grooves on
3 said first and second rolls are aligned.

1 8. The assembly of Claim 6, wherein:
2 said first and second rolls are timed to rotate such that the grooves on
3 said first and second rolls are not aligned.

1 9. The assembly of Claim 6, wherein:
2 said first and second rolls can be selectively timed such that the grooves
3 on said first and second rolls may be either aligned or not aligned.

1 10. The assembly of Claim 9, wherein:
2 said first and second rolls abut.

1 11. The assembly of Claim 9, wherein:

1 said first surface of said at least one groove is nearly perpendicular to the
2 direction of crop travel through said first and second rolls.

1 12. The assembly of claim 10 wherein:
2 said at least one groove is continuous.

1 13. A conditioner roll for use on a crop conditioning machine comprising:
2 an elongate rotatable roll having an axis of rotation and a peripheral
3 surface;
4 said roll comprising an elongate cylindrical rigid body portion having a
5 generally smooth peripheral surface with a layer of hard elastomeric
6 material affixed thereto, said elastomeric layer having at least one groove
7 therein, said groove being formed in a spiral along the length of said rigid
8 body portion; and
9 said at least one groove generally having a step-like cross-sectional
10 configuration comprised of at least a first and second surfaces, said first
11 surface being generally perpendicular to the tangent of said peripheral
12 surface of said second roll and said second surface tapering at an angle
13 from the edge of said first surface closest to said second axis of rotation,
14 forming a trailing edge to said peripheral surface of said second roll, forming
15 a leading edge.

1 14. The roll of claim 13, wherein:
2 said first surface has a depth in the range of 0.25 to 0.50 inches.

1 15. The roll of Claim 14, wherein:
2 said second surface has a length in the range of 1.0 to 1.5 inches.

1 16. The roll of Claim 15, wherein:
2 said at least one groove comprises 3 to 8; and

1 said grooves are symmetrically and arranged around the said peripheral
2 surface of said roll.

1 17. The roll of claim 16, wherein:
2 said at least a first and second surfaces includes a third surface
3 adjacent to said second surface and at a slight upward angle relative
4 thereto.

1 18. The assembly of Claim 17, wherein:
2 said elastomeric material is urethane.

1 19. The roll of Claim 18, wherein:
2 said elastomeric material comprises 80 Shore A durometer or higher.

1 20. The roll of Claim 18, wherein:
2 said first surface of said at least one groove is nearly perpendicular to the
3 direction of crop travel through said first and second rolls.

1 21. The assembly of claim 19 wherein:
2 said at least one groove is continuous.